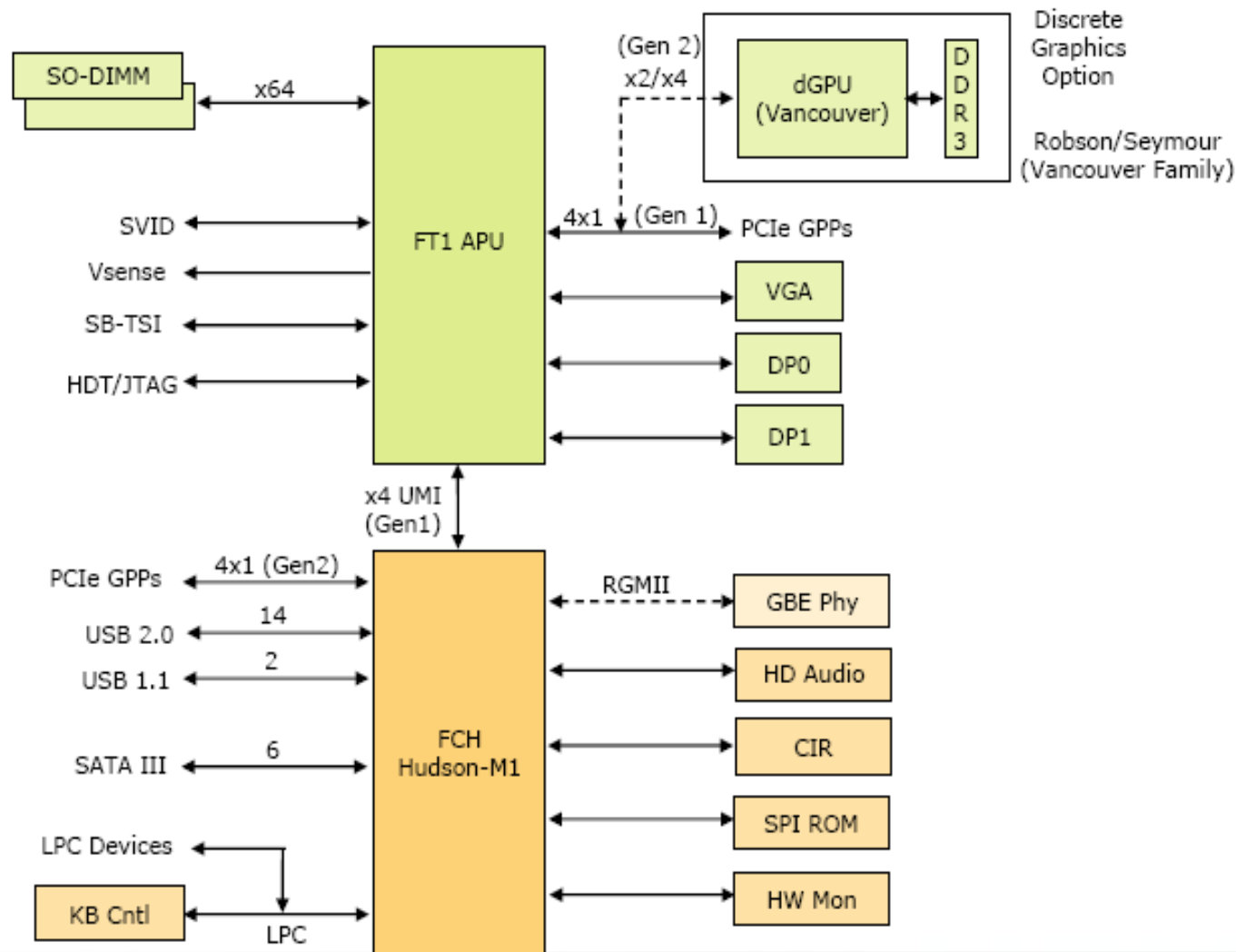


Introduction of EPC 1215B--AMD Nile Platform

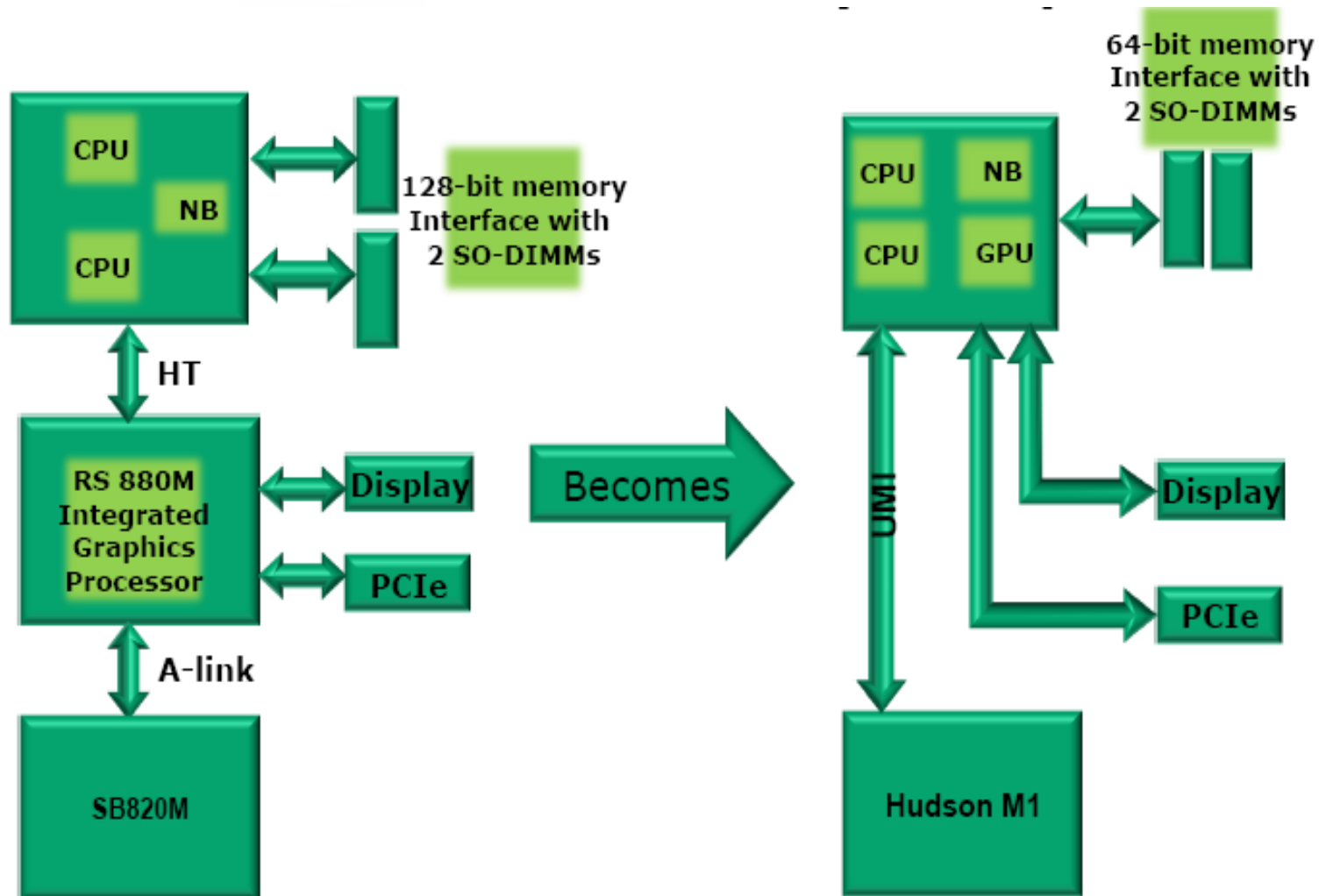
Agenda

- Brazos Platform Block Diagram
- 1215B Block Diagram
- 1215B Power sequence
- FT1 APU
- 1215B FT1 APU & FCH(Hudson-M1)
- EC KB3310
- Clock Generator
- Part Signal measure
- Issue analyze
- Q&A

Brazos Platform Block Diagram

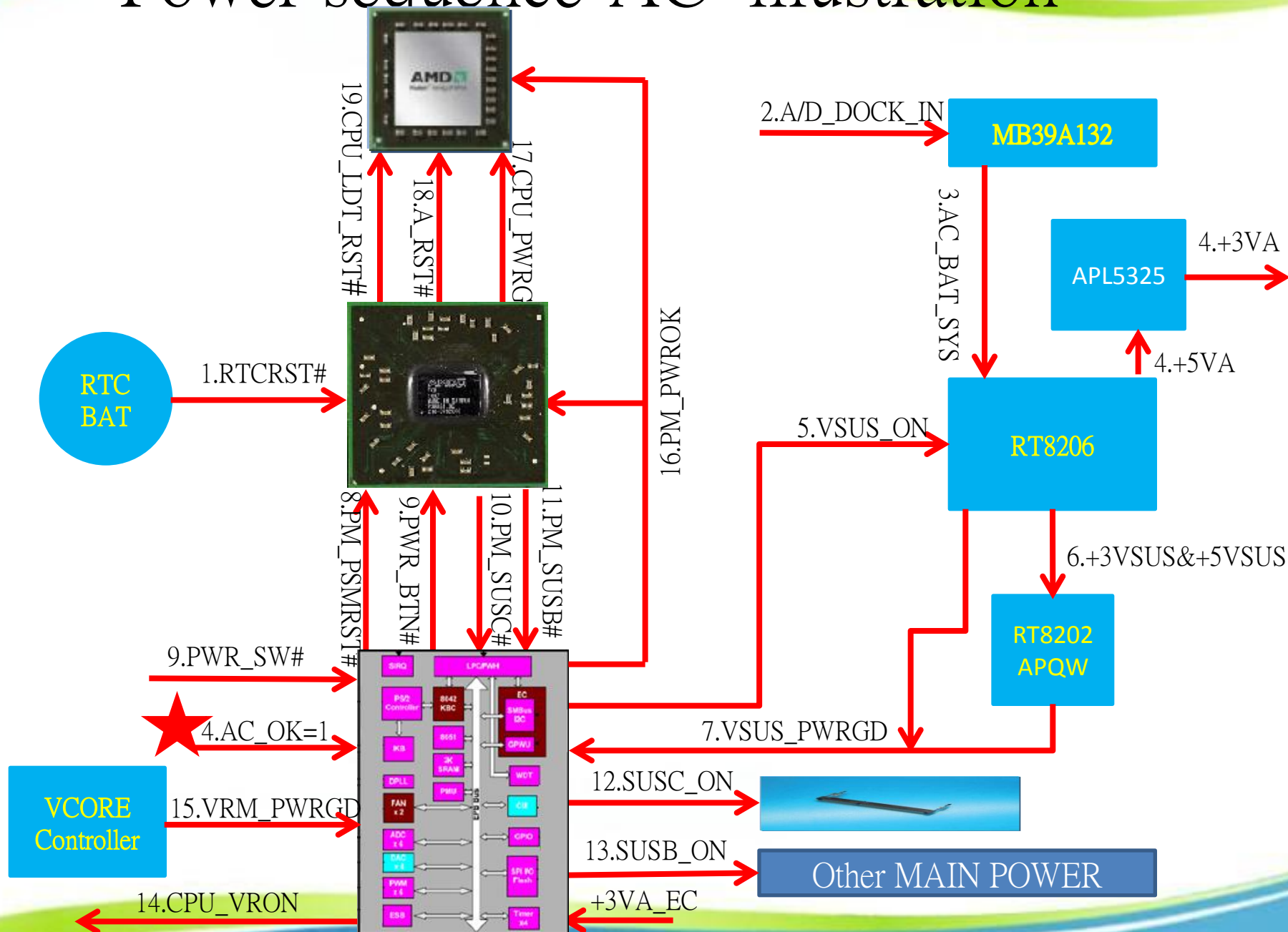


Fusion Architectural **Physical** Change from ASB2 Nile to FT1 Brazos (Fusion)

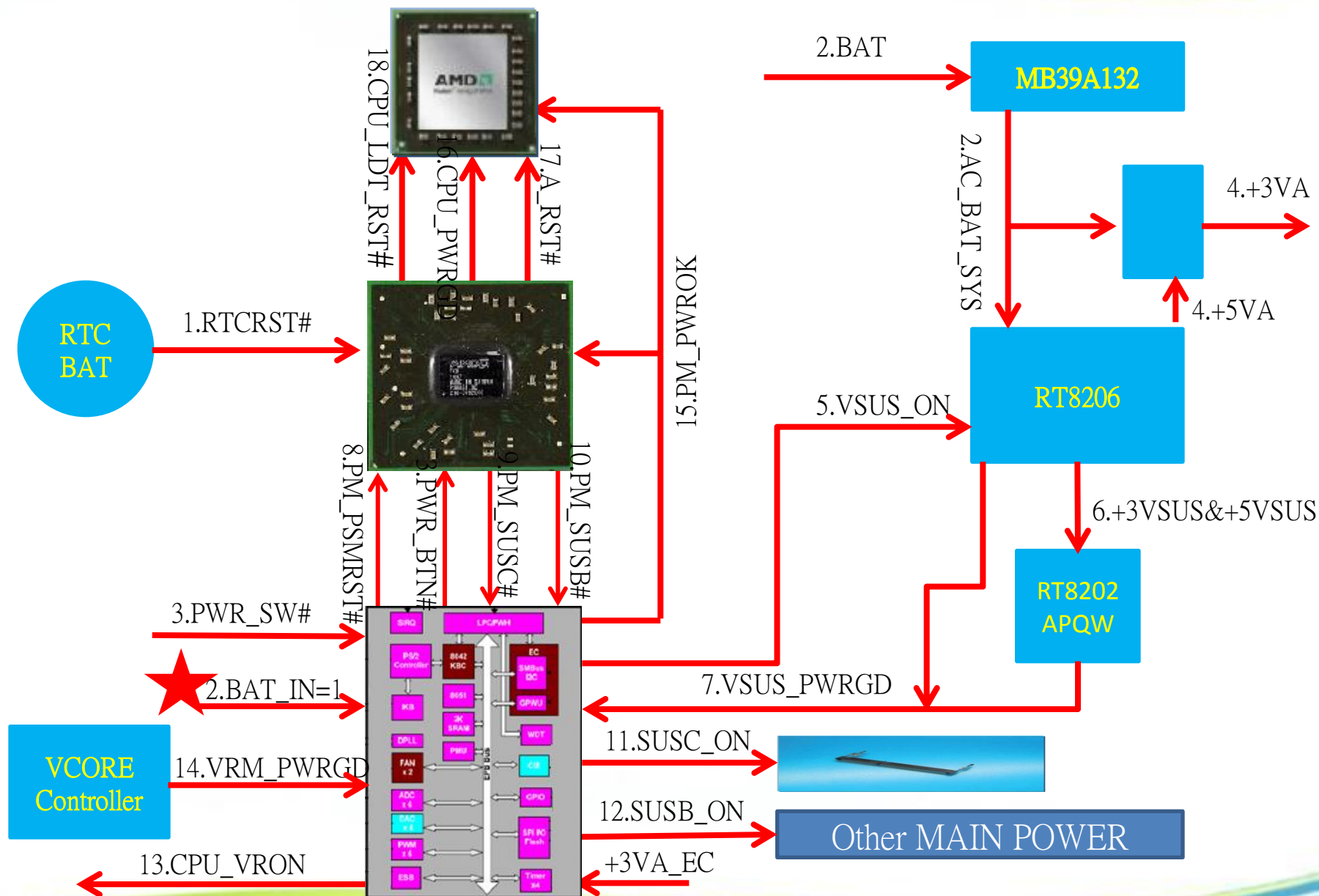


1215B Power sequence

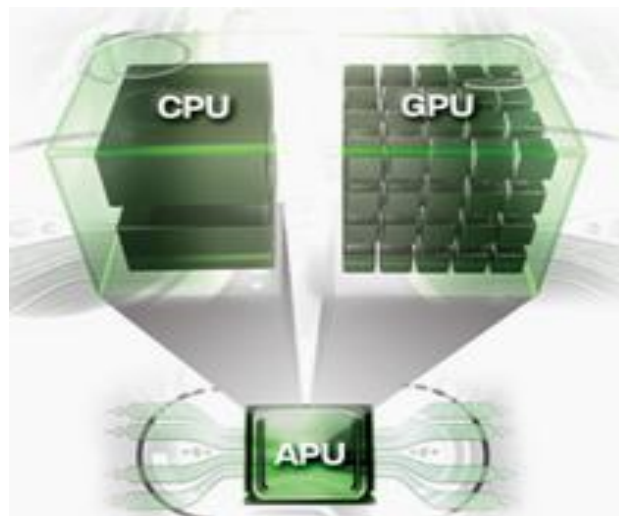
Power sequence-AC illustration



Power sequence-DC illustration



FT1 APU



- The AMD FT1 processor combines the central processing unit (CPU) with the graphics processing unit (GPU) in a single-chip Accelerated Processing Unit (APU) package. The APU connects to the Fusion Controller Hub (FCH) through the Unified Media Interface (UMI) to provide connections to the different system devices.

C-state Power Management

- Core vs. Package C-states
 - Cores enter “core C-states” independently
 - Processor enters “package C-state” when all cores are at X “core C-state” or deeper
- Core/Package C6 (CC6/PC6)
 - L1 and L2 flushed by hardware
 - Hardware saves core state to protected DRAM
 - PLLs enter low power mode
 - CC6: Core power is gated off on a per-core basis
 - PC6: VDD power plane goes to a very low voltage (C6VID)
- FT1 does not support C1e and CLMC

FT1 Power Planes

- Separate Power Planes Provided for the Cores and Northbridge
 - Unified power plane for all CPU cores
 - Isolated VDDCR_CPU and VDDCR_NB
 - VRM controlled via serial VID interface (SVI)
- VID Codes for VDDCR_CPU and VDDCR_NB
 - SVI (Serial VID Interface) provides independent Core VID and Northbridge VID controls
 - SVI frequency up to 3.4 MHz

1215B FT1 APU Feature

1215B used three CPU: E350/C50(dual core)&C30(single core)

- Package: FT1 BGA
- L2 cache: 1MB of E350/C50; 512KB of C30
- UMI(Unified Media Interface): 4 PCIe Gen1 lanes are dedicated for the UMI interface to the FCH
- Single Channel DDR3 Memory Support
 - Configuration: Two SO-DIMM one channel
 - Memory speed: Up to DDR3 1066
- Low Power state:
 - C-State (CC6/PC6)
 - L1 and L2 flushed by hardware
 - Hardware saves core state to protected DRAM
 - PLLs enter low power mode
 - CC6: Core power is gated off on a per-core basis
 - PC6: VDD power plane goes to a very low voltage (C6VID)

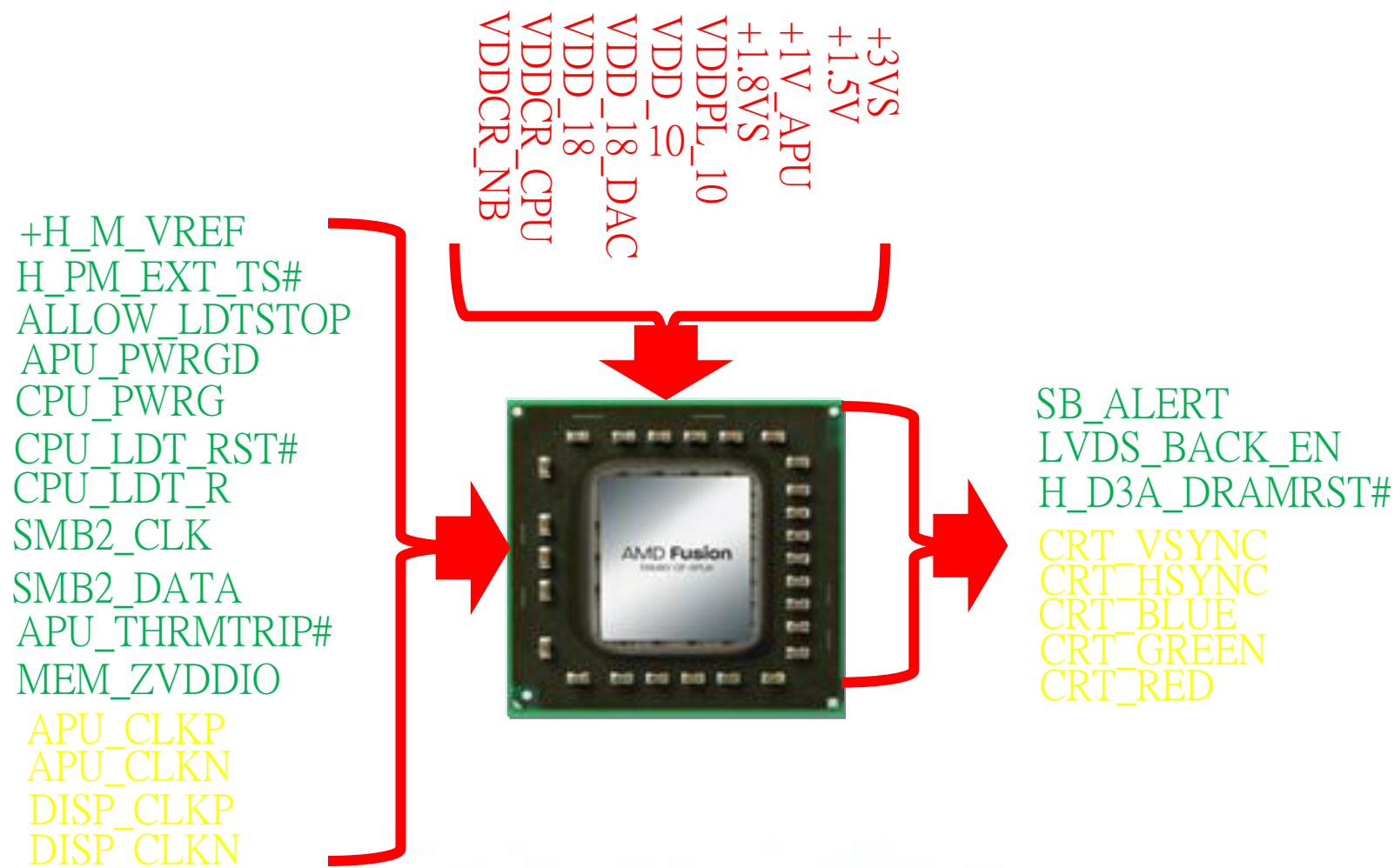
1215B FT1 Graphics Feature

- No Side port Memory
- PCIE GPP: x2 or x4 PCIE GPP supports discrete graphics at Gen2 speed or when used as GPP, at Gen1 speed.
- Integrated Graphic
 - Graphics Engine Clock: 500MHz (HD6310)
280MHz (HD6250)
 - AMD Power-play support
 - Support for DX11, UVD3, OpenCL1.1
 - Display Interface: LVDS, HDMI, VGA

APU related signals

- Hudson support following APU related signals
 - LDT_RST# : APU RESET_L
 - LDT_PG : APU PWROK
 - ALLOW_LDTSTOP : APU DMAActive#
 - Notify APU DMA activity
 - On APU, input controls entry and exit from sleep and power states
 - Reestablish the UMI link
 - PROCHOT# : APU PROCHOT_L
 - When asserted, generate SCI or SMI or OS/BIOS
 - THERMTRIP# : APU THERMTRIP_L
 - Indicate FCH that a thermal trip has occurred
 - When asserted, FCH to transition system to S5 immediately
- Hudson paired with APU will not utilize
 - LDT_STP# signal
 - UMI link is not HT link and does not require LDT_STP#

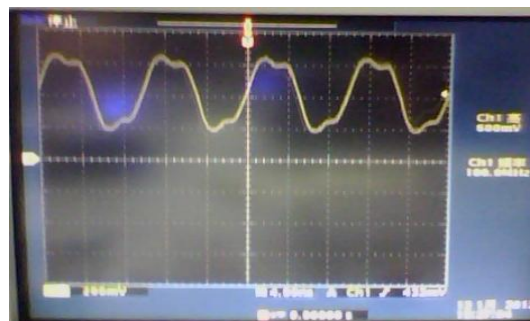
FT1 APU Signal measure



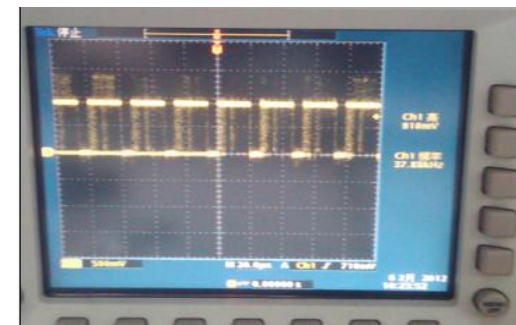
FT1 APU Pin waveform

APU_CLKP	100Mhz	P1
APU_CLKN	100Mhz	P1
DISP_CLKP	100Mhz	P1
DISP_CLKN	100Mhz	P1
H_SVC	1.76V	
H_SVD	1.76V	
SMB2_CLK	3.32V	
SMB2_DATA	3.32V	
CPU_LDT_RST#	1.76V	
APU_PWRGD	1.76V	
APU_PROCHOT#	3.32V	
APU_THRMTRIP#	3.32V	
APU_ALERT	3.32V	
SB_ALERT	X	
VDDCR_CPU_SENSE	1.28V	
VSS_SENSE	1.28V	
ALLOW_LDTSTOP	1.76V	
APU_TEST35	1.76V	
APU_TEST36	1.76V	
APU_TEST34_L	X	
APU_TEST34_H	X	
CRT_DDC_DATA	4.8V	
CRT_DDC_CLK	4.8V	
CRT_VSYNC		P2
CRT_HSYNC		P3
CRT_BLUE		P4
CRT_GREEN		P5
CRT_RED		P5
DVI_DDCDAT1	4.8V	
dvi_DDCCLK1	4.8V	
BL_PWM_DA	3.36V	
H_D3A_DRAMRST#	1.56V	
H_PM_EXT_TS#	1.56V	
MEM_ZVDDIO	1.5V	
+H_M_VREF	900mv	
VDDCR_CPU	1.5V	
VDD_18	1.8V	
VDDCR_NB	960mv-1V	

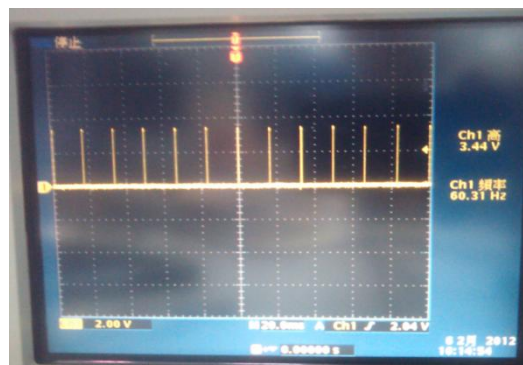
P1



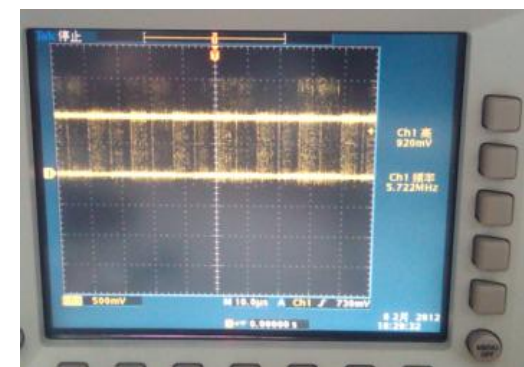
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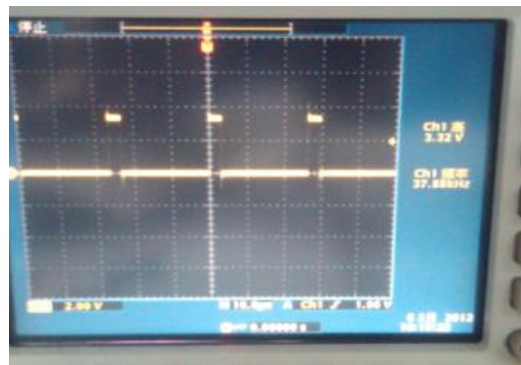
P2



P5



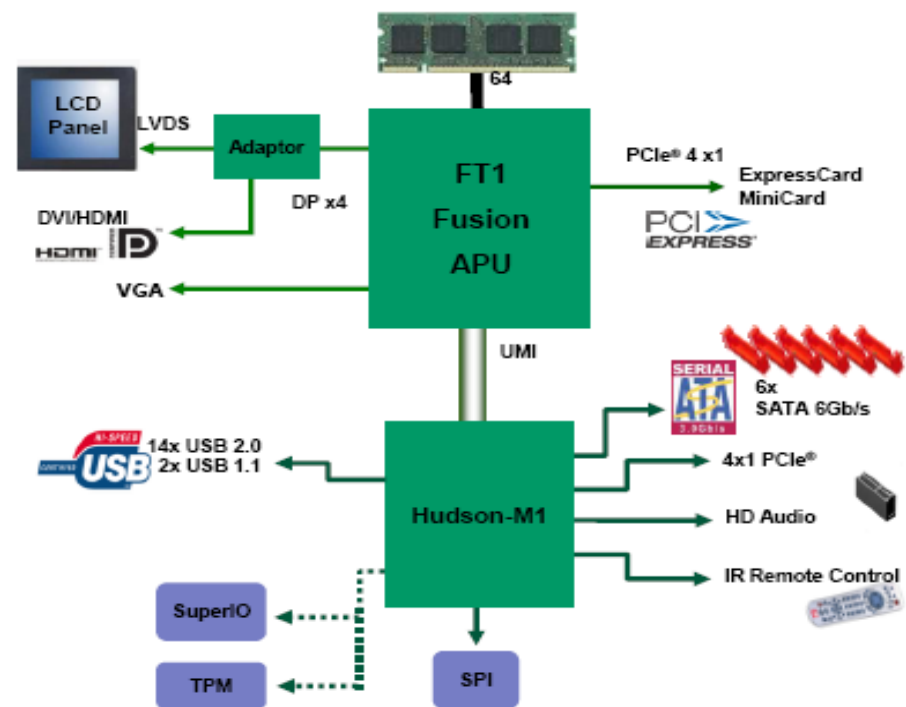
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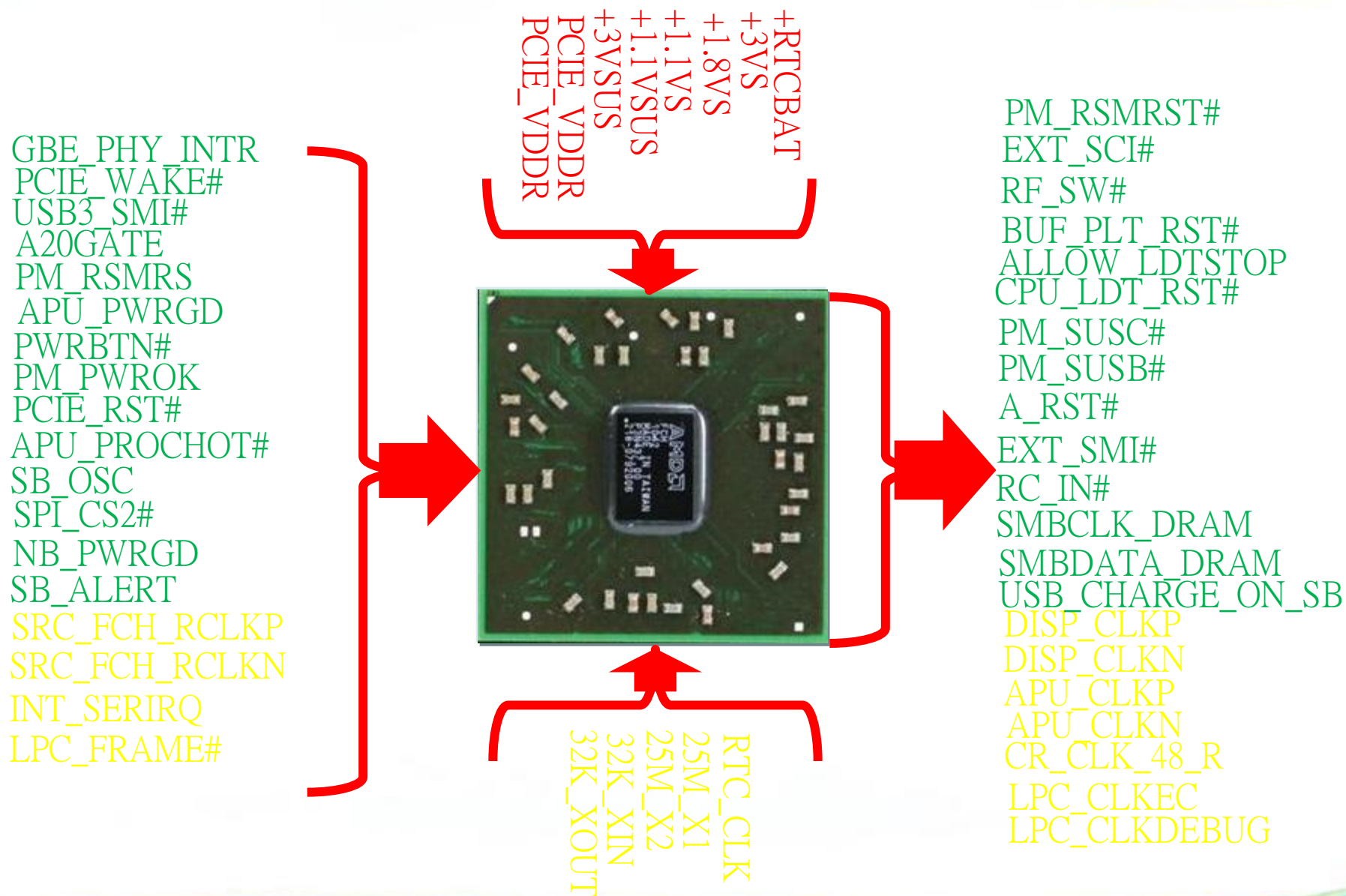
Hudson-M1 FCH

Hudson-M1 FCH Overview

- Hudson-M1 is a Fusion Controller Hub (FCH) supporting AMD's FT1 Fusion APU
- Integrate following functions:
 - 4 lanes UMI
 - 2 lanes of PCIe GEN-2
 - 14 USB 2.0
 - 6 ports SATA Gen-II
 - High Definition Audio
 - SMBus
 - LPC
 - Consumer IR
 - Integrated Clock Generator



Hudson-M1 Signal measure



Hudson-M1 Pin Voltage

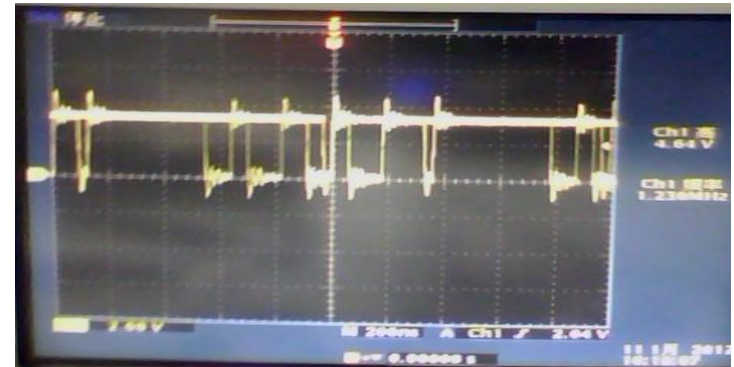
PCIE_RST#	3.3V		INT_SERIRQ		P12	SPI_CS2#	3.4V	
A_RST#	3V		LPC_CLKEC	33.33MHZ	P13	SB_GPIO200	720mV	
PCIE_VDDR	1.2V		LPC_CLKDEBUG	33.33MHZ	P13	SB_GPIO199	3.4V	
PCIE_TXP2_USB3.0	1.32V		PM_CLKRUN#	X		SMB2_DATA	3.4V	
PCIE_TXN2_USB3.0	1.32V		A_RST#	3V		SMB2_CLK	3.4V	
SRC_FCH_RCLKP	100MHZ	P9	BUF_PLT_RST#	2.88V		WLAN_LED	3.4V	
SRC_FCH_RCLKN	100MHZ	P9	PCIE_RST#	3.4V		CR_CLK_48_R		P14
DISP_CLKP	100MHZ	P9	RF_SW#	3.4V		SATA_TXP0_R	840mV	
DISP_CLKN	100MHZ	P9	PM_SUSB#	3.4V		SATA_TXN0_R	840mV	
APU_CLKP	100MHZ	P9	PM_SUSC#	3.4V		SATA_RXN0	X	
APU_CLKN	100MHZ	P9	PM_PWRBTN#	3.4V		SATA_RXP0	X	
CLK_PCIE_MINICARD	100MHZ	P9	PM_PWROK	3.4V		SATA_CALRP	X	
CLK_PCIE_MINICARD#	100MHZ	P9	SUS_STAT#	X		SATA_LED#	1.2V	
CLK_PCIE_LAN	100MHZ	P9	A20GATE	3.4V		SATA_X1	X	
CLK_PCIE_LAN#	100MHZ	P9	RC_IN#	3.4V		SATA_X2	3.4V	
H_NEC_USB3_CLK	100MHZ	P9	EXT_SCI#	3.4V		FCH_SPI_CS1#	3.4V	
H_NEC_USB3_CLK#	100MHZ	P9	EXT_SMI#	3.4V		USB_CHARGE_ON_SB	3.4V	
25M_X1	25MHZ		USB3_SMI#	3.4V		+3VS		
25M_X2	25MHZ		PCIE_WAKE#	3.4V		+1.8VS		
32K_XIN	32.768KHZ	P10	NB_PWRGD	3.4V		+1.1VS		
32K_XOUT	32.768KHZ	P10	PM_RSMRST#	3.4V		+3VSUS		
+RTC_BAT	3.12V		BT_ON/OFF#	X		+1.1VSUS		
INTRUDER_ALERT#	X		MINICARD_EN#	X		VDDPL_33_SYS	3.4V	
RTC_CLK	32.768KHZ	P11	CLKREQ#_MINICARD	X		VDDPL_11_SYS_S	1.1V	
CPU_LDT_RST#	1.8V		SB_SPKR_R	X		VDDAN_33_HWM_S	3.4V	
CPU_LDT_STOP#			SMBCLK_DRAM	3.4V		VDDIO_AZ_S	3.4V	
CPU_LDT_STOP#	X		SMBDATA_DRAM	3.4V				
APU_PWRGD	1.8V		CLK_REQ1#	3.4V				
APU_PROCHOT#	3.3V		SB_OSC	3.4V				
ALLOW_LDTSTOP	1.8V		GBE_PHY_INTR	3.4V				

Hudson-M1 Pin waveform

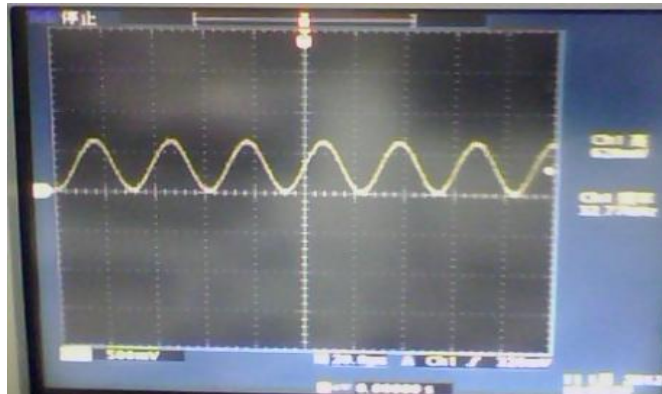
P9



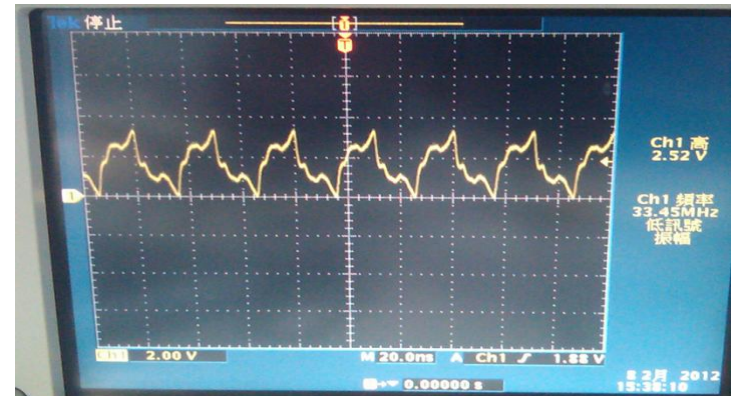
P12



P10



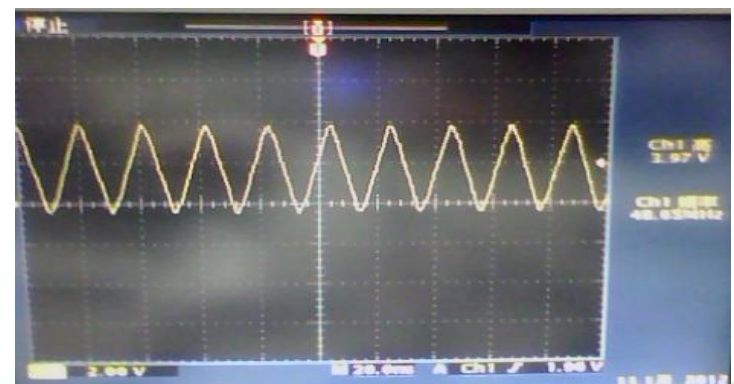
P13



P11



P14

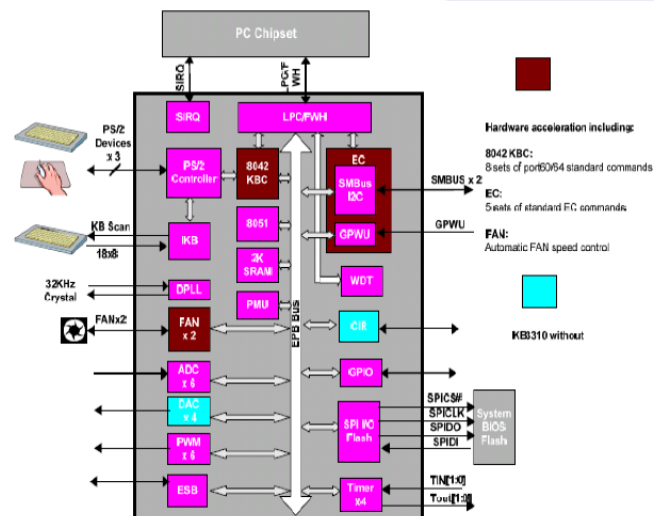


EC KB3310 Role

- Power sequence control with FCH
- Keyboard Controller/Touchpad
- Fan control
- LCD Backlight control
- SMBUS
 - Smart battery
 - Temperature monitor
- Embedded Controller
 - ACPI (PC power management): Sleep/hibernate/wake up/Lid switch
 - SCI – System Control Interrupt to FCH
- GPIO: Control System Power, LED, AC/DC detect, Charge/discharge control
- SPI BIOS ROM, Firmware (8051)
- Watch Dog Timer

ENE EC KB3310

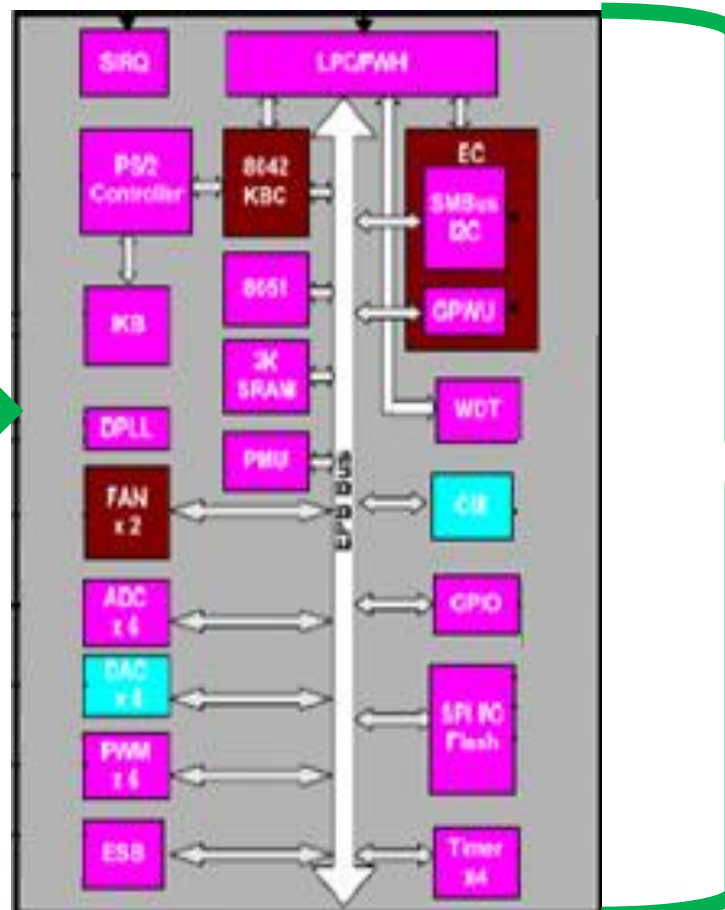
- Power sequence control with SB7
- Keyboard Controller/Touchpad
- CPU Fan control
- LCD Backlight control
- SMBUS
- Smart battery
- Thermal sensor
- Embedded Controller
- ACPI (PC power management): Sleep/hibernate/wake up/Lid switch
- SCI –System Control Interrupt to South Bridge
- GPIO: Control System Power, LED, AC/DC detect, Charge/discharge control
- SPI BIOS ROM, Firmware (8051)
- Watch Dog Timer



EC Signal measure

PM_SUSC#
 EC_RSMRST#
 PWR_SW_EC#
 MARATHON_EC#
 PWRLIMIT#
 EXT_SCI#
 RC_IN#
 VRM_PWRGD
 VSUS_PWRGD
 FORCE_OFF#
 PM_SUSB#
 EC_RST#
 LID_EC_R#
 A20GATE
 BUF_PLT_RST#
 EXT_SMI#
 AC_OK
 LPC_FRAME#
 LPC_CLKEC
 SPI_DO
 SPI_MODE#
 PWRLIMIT#

+3VA K_XCLKI K_XCLKO



PS-ON
 PM_PWRBTN#
 EC_PWROK
 RC_IN#
 PM_PWROK
 SPI_WP#
 SUSB_ON
 SUSC_ON
 VSUS_ON
 CPU_VRON
 THRO_CPU
 SPI_DI
 SPI_CLK
 SPI_CS#
 FAN0_PWM
 LCD_BACKOFF#
 PM_LEVELDOWN#

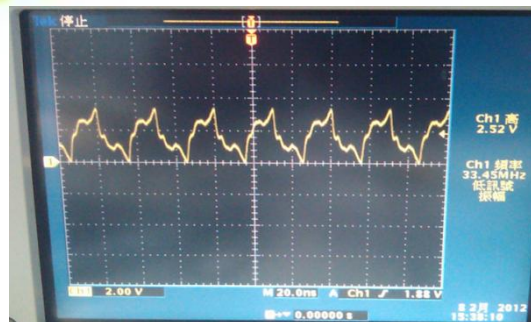
BL_PWM_DA +3VA_AEC

EC Pin Voltage & waveform

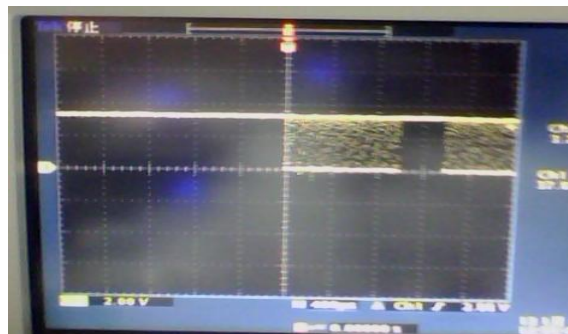
INT_SERIRQ	3.4V	
LPC_FRAME#		P16
LPC_CLKEC	3.8V-33.43MHZ	P14
CHG_LED_GREEN#	3.4V	
RC_IN#	3.4V	
EXT_SCI#	3.4V	
A20GATE	3.4V	
BUF_PLT_RST#	2.8V	
EC_RST#	3.4V	
Caps_LED#	3.4V	
USB_CHARGE_EN_EC	3.4V	
TP_DATA	3.4V	
SMB2_CLK		P17
SMB2_DATA		P18
MARATHON_EC#	3.4V	
HOTKEY_SW1#	3.4V	
EXT_SMI#	3.4V	
LID_EC_R#	3.4V	
PWRLIMIT#	3.4V	
AC_OK	3.4V	
BAT_IN	3.4V	
USB_detect#	3.4V	

CHG_LED_ORANGE#	3.4V	
PWR_LED_UP	3.4V	
K_XCLKI	32.768Khz	P19
K_XCLKO	32.768Khz	P19
PS-ON	3.4V	
PM_LEVELDOWN#	3.4V	
BL_PWM_DA	3.44---212.8Khz	P20
+3VA	3V	
+3VA_AEC	3V	
VRM_PWRGD_EC	3.4V	
BL_PWM_DA	3.4V	
PM_PWRBTN#	3.4V	
FAN0_PWM		P15
LCD_BACKOFF#	3.4V	
SPI_MODE#	3.4V	
SUSC_ON	3.4V	
VSUS_ON	3.4V	
CPU_VRON	3.4V	
SUSB_ON	3.4V	
EC_PWROK	3.4V	
CHG_EN#	3.4V	
SPI_WP#	3.4V	
PWRLIMIT#	3.3V	

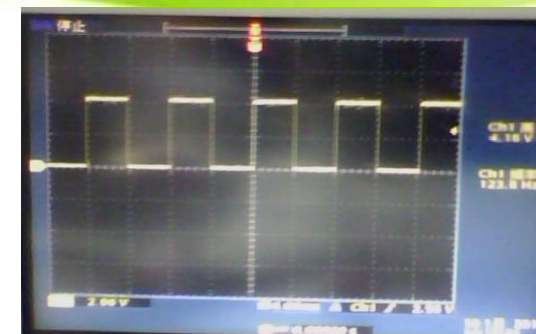
P14



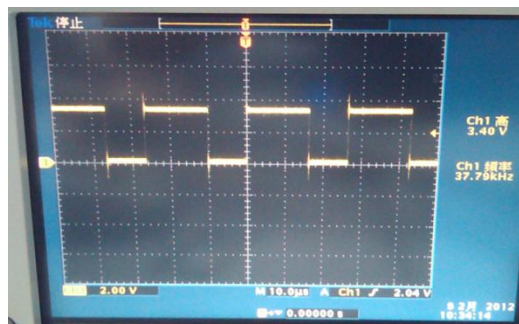
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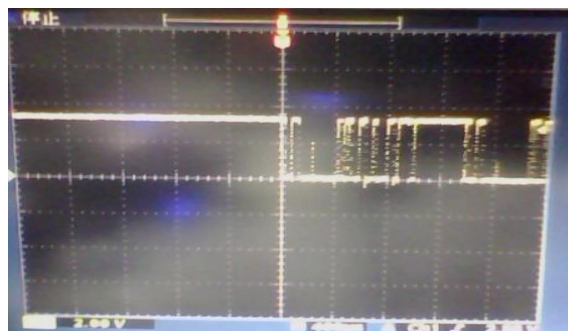
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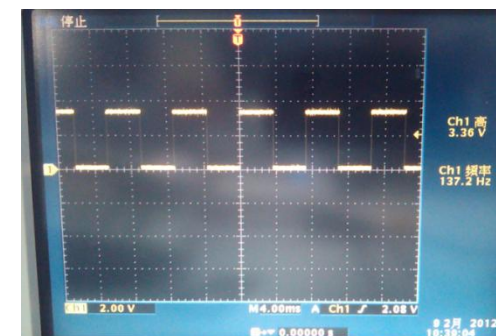
P15



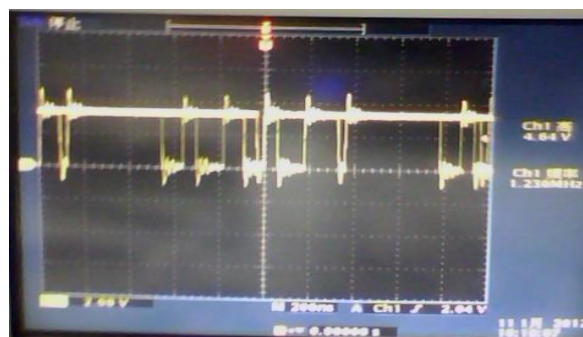
P18



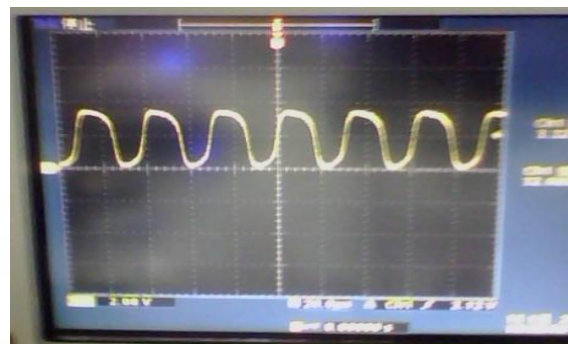
P21



P16



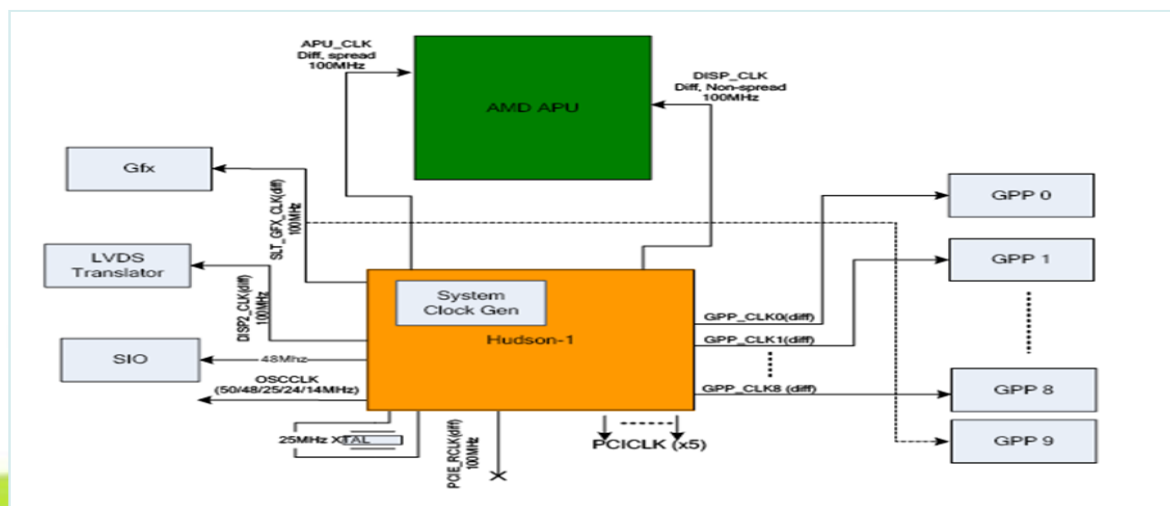
P19



Clock Generator

- Hudson-M1 has an integrated system clock generator that can be used to generate the required system clocks, thus eliminating the need for an external clock generator. However, it does support a mode of operation that allows an external clock generator to be used in the system. The clock generator mode is selected by a power-on configuration strap pin.
- 1215B first use external clock generator ICS9LPRS482AGLFT for OC, but last use integrated clock generator for cost down.

- If Hudson-M1 is in external clock mode, the clock sources it requires are a 25MHz crystal as internal PLL clock source, a 32-KHz crystal for the RTC, and a 100MHz differential clock pair for the PCIe reference clocks. In addition to the PCIe clocks, Hudson-M1 also uses the 100-MHz clock to generate various internal clocks.
- If Hudson-M1 is set to integrated clock mode, only a 25MHz crystal for master reference and a 32-KHz crystal for the RTC are required. Hudson-M1 will then generate all the system clocks needed, which include the APU reference clocks, the graphics clocks, the 25MHz clock for SATA, the 48MHz clocks for USB, and so on.

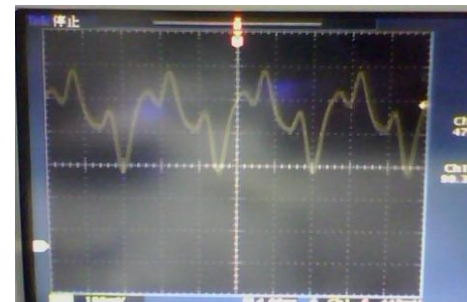


Clock Domain	Frequency	Source	Internal Clock Mode Function	External Clock Mode Function
25M_X1, 25M_X2	25 MHz	25-MHz Crystal	Master reference clock	Auxiliary reference clock
PCIE_RCLKP, PCIE_RCLKN	100 MHz	Main clock generator (external clock)	–	FCH reference clock
SATA_X1, SATA_X2	25 MHz	25-MHz Crystal	Not used. SATA clock is generated internally using 25M-X1/25M_X2 reference clock.	
32K_X1, 32K_X2	32 KHz	32-KHz Crystal	Reference clock for RTC	
USBCLK	48 MHz	48-MHz OSC or internal USB 48-MHz PLL	Not Used. USB clock is generated using the 25M-X1/25M_X2 reference clock.	

CLOCK Gen Pin Voltage & waveform

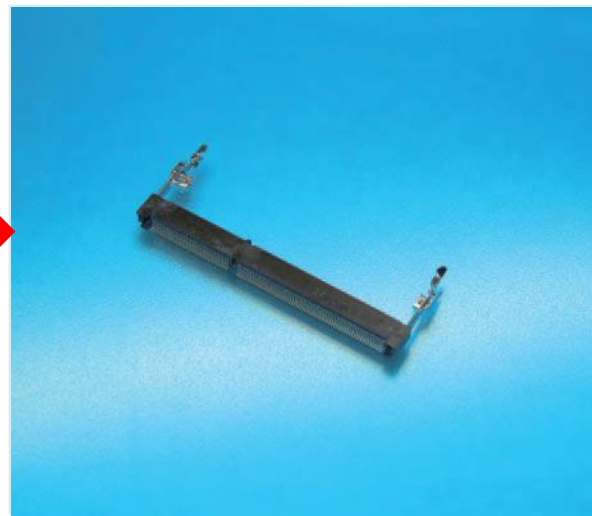
PIN1	+3.3VS_CLK	3.4V	
PIN2	SB_OSC	3.4V	
PIN3			
PIN4	SEL_HTT66	X	
PIN5	VDDREF_CLK	3.4V	
PIN6	X		
PIN7	XTAL1_CLK	2.3V--14.318M	P2
PIN8	XTAL2_CLK	2.3V--14.318M	P2
PIN9	VDDUSB_CLK	3.4V	
PIN10	USB3_CLK_48	X	
PIN11	CR_CLK_48_R		P1
PIN12	X		
PIN13	SMBCLK_DRAM	3.4V	
PIN14	SMBDATA_DRAM	3.4V	
PIN15	X		
PIN16	X		
PIN17	H_NEC_USB3_CLK#	100MHZ	P3
PIN18	H_NEC_USB3_CLK	100MHZ	P3
PIN19	X		
PIN20	+3.3VS_CLK		
PIN21	+3.3VS_CLK		
PIN22	X		
PIN23	CLK_PCIE_MINICARD#	100MHZ	P3
PIN24	CLK_PCIE_MINICARD	100MHZ	P3
PIN25	CLK_PCIE_LAN#	100MHZ	P3
PIN26	CLK_PCIE_LAN	100MHZ	P3
PIN27	APU_CLKN	100MHZ	P3
PIN28	APU_CLKP	100MHZ	P3

PIN29	X		
PIN30	+3.3VS_CLK	3.4V	
PIN31	SRC_FCH_RCLKN	100MHZ	P3
PIN32	SRC_FCH_RCLKP	100MHZ	P3
PIN33	DISP_CLKN	100MHZ	P3
PIN34	DISP_CLKP	100MHZ	P3
PIN35	X		
PIN36	X		
PIN37	+3.3VS_CLK	3.4V	
PIN38	X		
PIN39	X		
PIN40	X		
PIN41	X		
PIN42	VDDA_CLK	3.4V	
PIN43	X		
PIN44	X		
PIN45	VDDA_CLK	3.4V	
PIN46	X		
PIN47	X		
PIN48	X		
PIN49	+3.3VS_CLK	3.4V	
PIN50	X		
PIN51	X		
PIN52	PD#	3.4V	
PIN53	RESTORE#	3.4V	
PIN54	X		
PIN55	X		
PIN56	X		



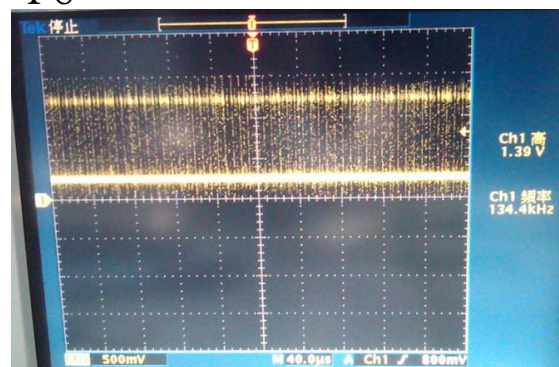
MEMORY Signal measure

H_D3_VREF_DIMMCA
 H_D3_VREF_DIMMDQ
 H_PM_EXT_TS#1_R
 H_D3A_BA2
 SMBCLK_DRAM
 SMBDATA_DRAM
 H_D3A_DRAMRST#
 H_D3_VREF_DIMMDQ
 +3VS
 +1.5V
 +0.75VS

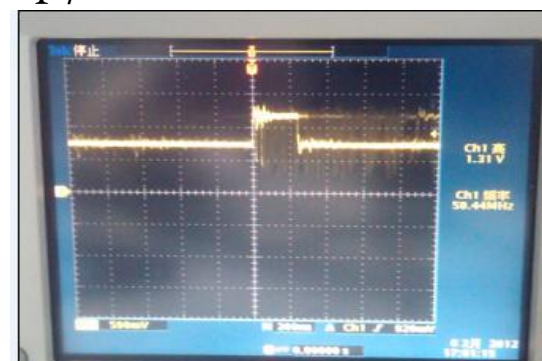


H_D3A_DM1
 H_D3A_CKE0
 H_D3B_CS#0
 H_D3A_RAS#
 H_D3A_CAS#
 H_D3A_WE#
 H_D3A_DQ26
 H_D3A_DQSP0

P6



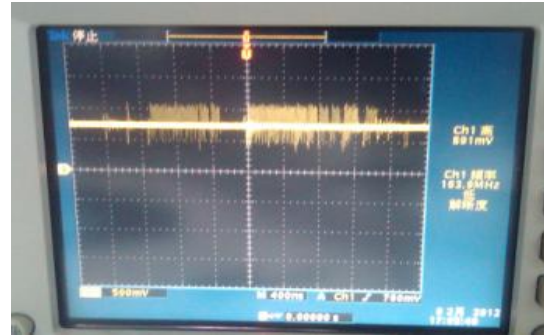
P7



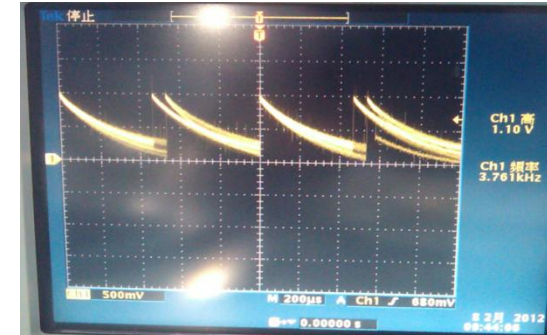
MEMORY Pin waveform

H_D3A_CKE0		P6
H_D3A_CKE1	X	
H_D3B_CS#0		P7
H_D3B_CS#1	X	
H_D3A_RAS#		P8
H_D3A_CAS#		P9
H_D3A_WE#		P9
H_D3A_CLKP1	X	
H_D3A_CLKN1	X	
H_D3A_BA2	680mV	
H_D3_VREF_DIMMDQ	760mV	
H_D3A_DQ26		P10
H_D3A_DQSP0		P10
H_D3A_DM1		P11
H_D3A_DRAMRST#	1.5V	
H_D3A_DM2		P11
H_D3A_DQSN3		P12
H_D3A_DQSP3		P12
H_D3A_MA15		P13
H_D3A_BA1		P8
H_D3_VREF_DIMMCA	760mV	
H_D3A_DQSN5		P12
H_D3A_DQSP5		P12
H_D3A_DQSN7		P12
H_D3A_DQSP7		P12
H_PM_EXT_TS#1_R	1.5V	
SMBDATA_DRAM	3.3V	
SMBCLK_DRAM	3.3V	
H_D3_VREF_DIMMDQ	760mV	
H_D3A_DQSN1		P12
H_D3A_DQSP1		P12
H_D3A_DQSN2		P12
H_D3A_DQSP2		P12
H_D3A_CS#1	X	
H_D3A_CS#0	X	
H_D3A_ODT0	X	

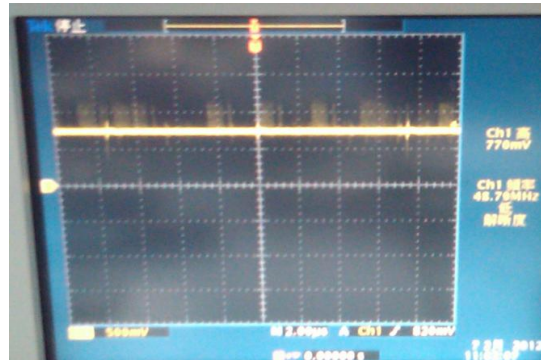
P8



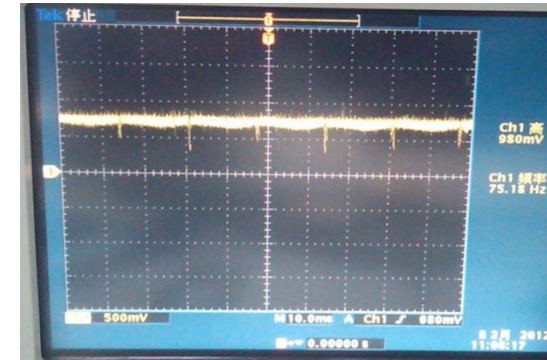
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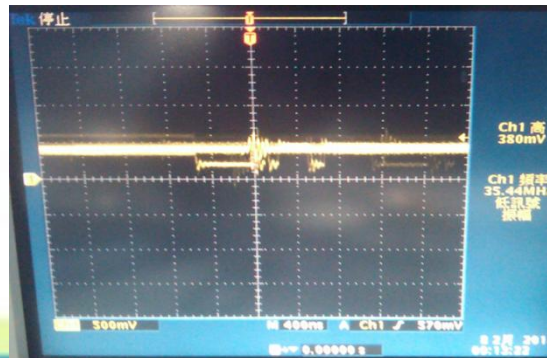
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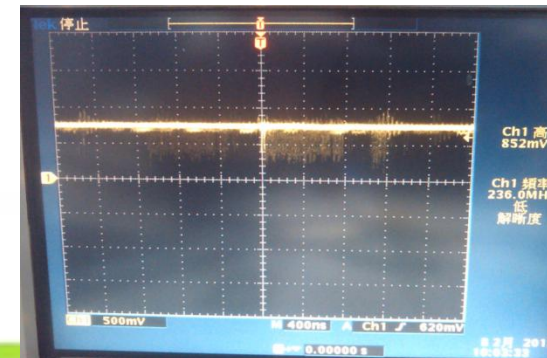
P12

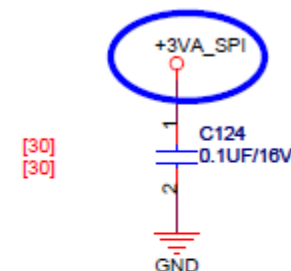


P10

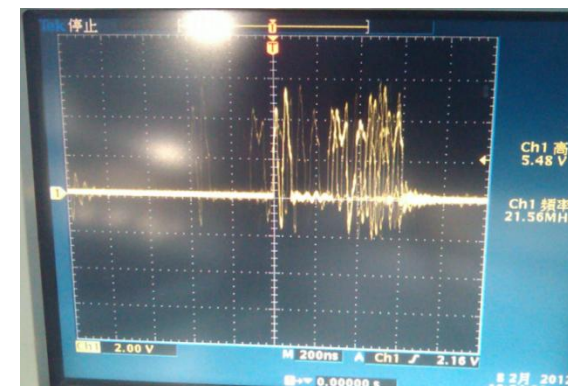
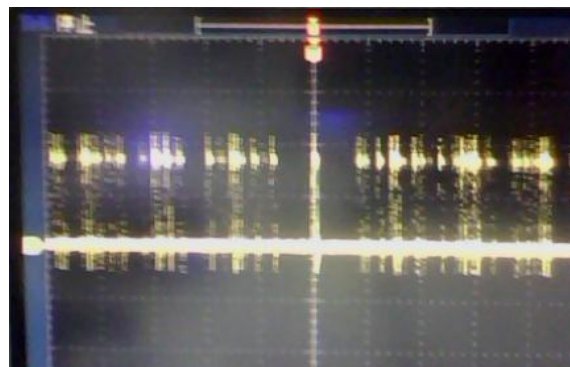


P13



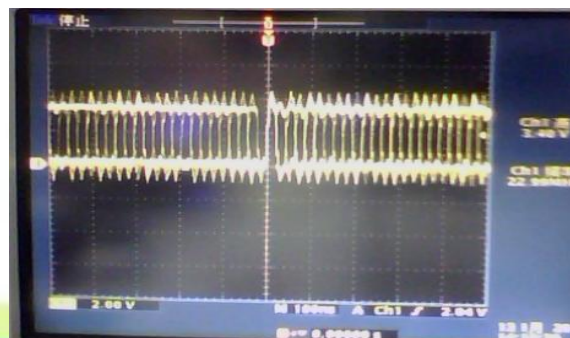


P21

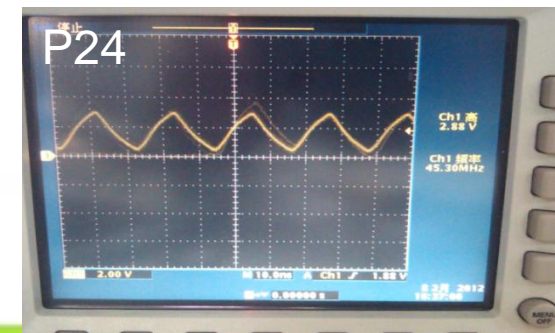


SPI_CS#	4.5V	P21
SPI_DO	3.4V	P22
SPI_WP#	3.4V	
X	x	
SPI_DI	5.4V	P23
SPI_CLK	2.88V	P24
SPI_HOLD#	3.4V	
+3VA SPI	3.4V	

P22



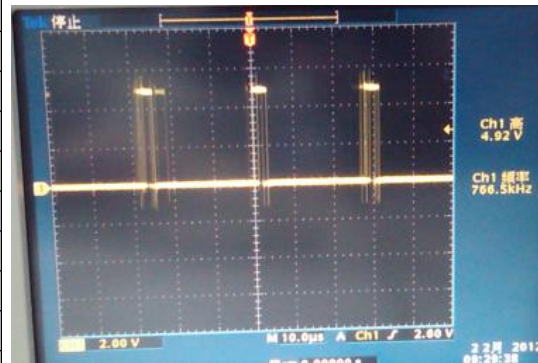
P24



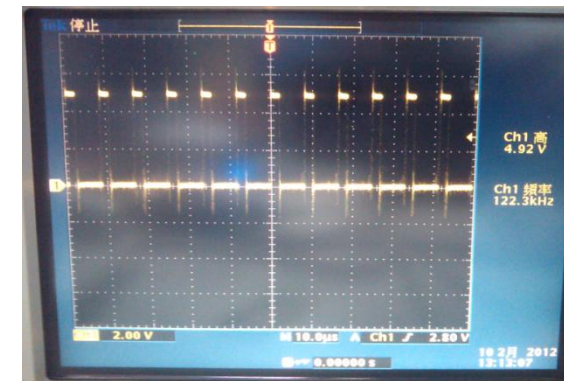
RT8206AGQW Pin Voltage & waveform

PIN1	P +3VSUS +5VSUS_REF 10	1.9V
PIN2	P +3VSUS +5VSUS_TON 10	1.9V
PIN3	5VA	5V
PIN4	P_5VA3VA_EN 10	18.8V
PIN5	X	
PIN6	AC_BAT_SYS	19.2V
PIN7	5VA	5V
PIN8	X	
PIN9	P +5VSUS_BYP 30	5V
PIN10	P +5VSUS_VO 10	5V
PIN11	P +5VSUS_FB 10	2V-2.5V
PIN12	P +5VSUS_ILIM 10	2V
PIN13	VSUS_PWRGD	3.4V
PIN14	P +5VSUS_EN 10	3.4V
PIN15	P +5VSUS_UG 20	P2
PIN16	P +5VSUS_PHASE 20	P2
PIN17	P +5VSUS_BOOT 20	P2
PIN18	P +5VSUS_LG 20	P1
PIN19	5VA	5V
PIN20	P_SUS_SECFB 10	2.2V
PIN21	X	
PIN22	X	
PIN23	P +3VSUS_LG 20	P3
PIN24	P +3VSUS_BOOT 20	P4
PIN25	P +3VSUS_PHASE 20	P4
PIN26	P +3VSUS_UG 20	P4
PIN27	P +3VSUS_EN 10	3.4V
PIN28	VSUS_PWRGD	3V
PIN29	P +3VSUS +5VSUS_REF 10	2V
PIN30	X	
PIN31	X	
PIN32	P +3VSUS_FB 10	2V

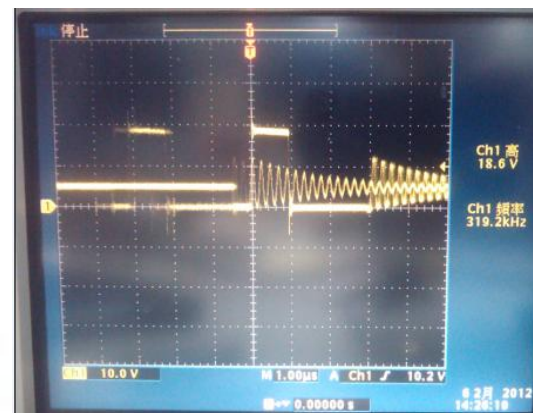
P1



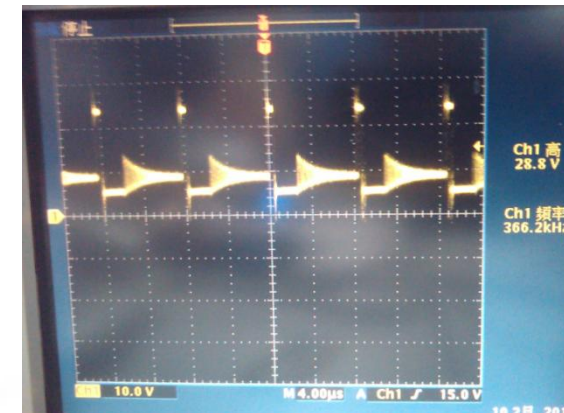
P3



P2



P4



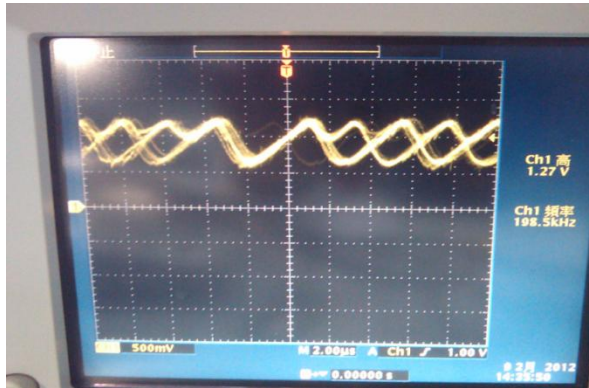
RT8870AGQW Pin Voltage

Pin1	P_CPU_BIAS_10	2.1V	
Pin2	CPU_VRON	3.4V	
Pin3	H_SVC	2V	
Pin4	H_SVD	X	
Pin5	HT_CPU_PWRGD	3.4V	
Pin6	VRM_PWRGD	3.4V	
Pin7	P_CPU_VFIX_10	3.4V	
Pin8	P_NB_OCSET_10	2.3V	
Pin9	P_CPU_VCC_20	5V	
Pin10	P_NB_FB_10	1V	
Pin11	P_NB_COMP_10		P1
Pin12	P_NB_TON_10	1V	
Pin13	P_NB_ISP_10	X	
Pin14	P_NB_ISN_10	1V	
Pin15	x		
Pin16	P_NB_LG_20		p2
Pin17	P_NB_PHASE_20		p3
Pin18	X	x	
Pin19	P_NB_UG_20		p4
Pin20	P_NB_BST_20		p4

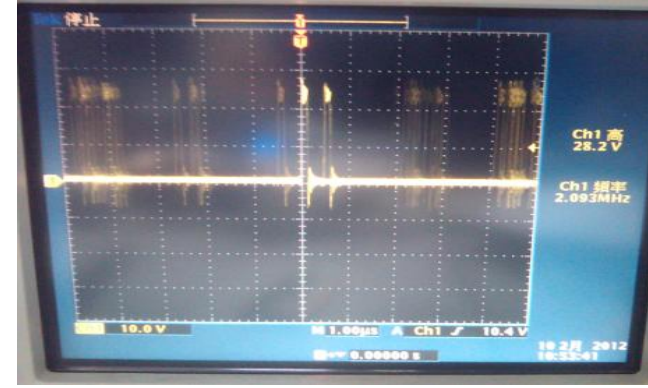
Pin21	P_CPU_BST_20		p5
Pin22	P_CPU_UG_20		p5
Pin23	P_CPU_ISP0_10	x	
Pin24	x		
Pin25	P_CPU_LG_20		p6
Pin26	P_CPU_PVCC_20		
Pin27	P_CPU_PVCC_20	5v	
Pin28	x		
Pin29	X		
Pin30	X		
Pin31	X		
Pin32	P_CPU_ISN1_10	5v	
Pin33	P_CPU_ISP1_10	5V	
Pin34	P_CPU_RGND_10	5V	
Pin35	P_CPU_ISN0_10		1.4
Pin36	P_CPU_ISP0_10		1.4
Pin37	P_CPU_TON_10		1.4
Pin38	P_CPU_COMP_10		1.4
Pin39	P_CPU_FB_10		1.4
Pin40	P_CPU_OCSET_10		2.26

RT8870AGQW Pin waveform

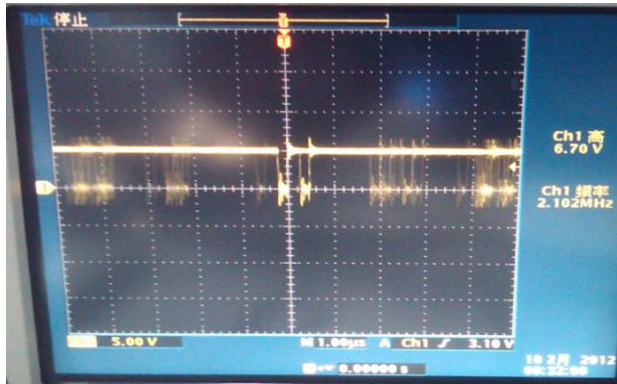
P1



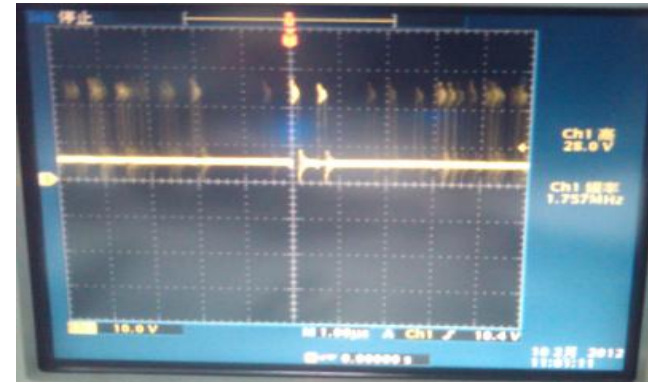
P4



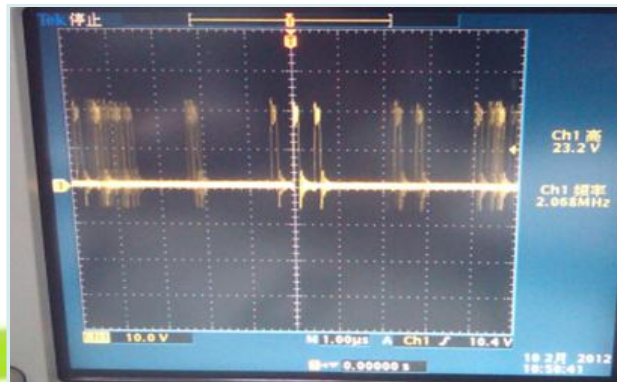
P2



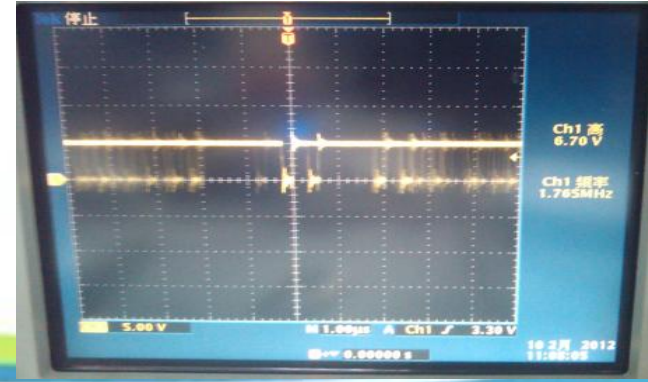
P5



P3



P6

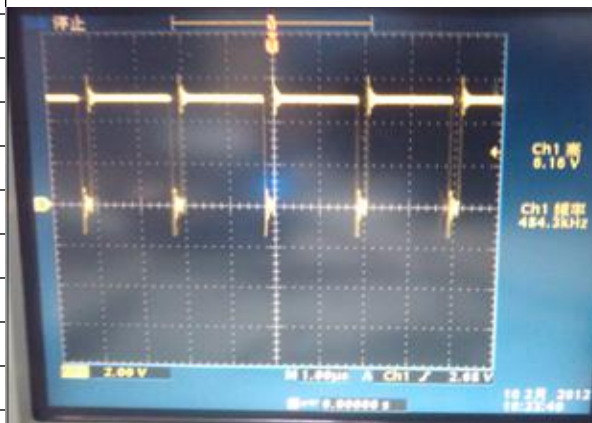


RT8202A Pin Voltage & waveform

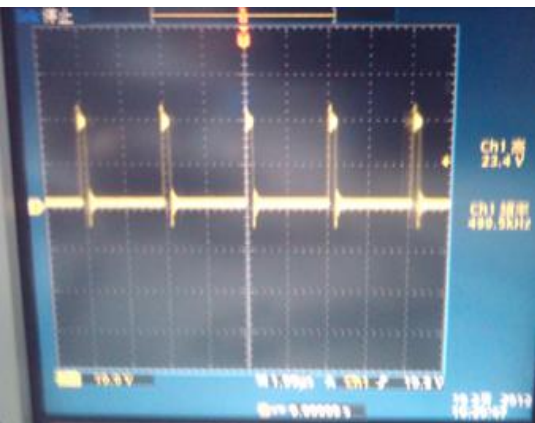
PIN1	1.5V	1.5V	
PIN2	+5VSUS	3V	
PIN3	P_1.5V_FB_10	800mV	
PIN4	X		
PIN5	X		
PIN6	X		
PIN7	X		
PIN8	P_1.5V_LG_20		P1
PIN9	+5VSUS		
PIN10	P_1.5V_OC_10		P2
PIN11	P_1.5V_PHASE_20		P3
PIN12	P_1.5V_UG_20		P4
PIN13	P_1.5V_BOOT_20		P4
PIN14	X		
PIN15	P_1.5V_EN_10		1.7V
PIN16	P_1.5V_TON_10		1V
PL502#1			P3

PM_LEVELDOWN#	X	
PWR_SW#_IO	3V	
PWRBTN_LED_IO	X	
PWRON_LED+	2.9V	
MIC1_JD	2.4V	mic in will pull low
DLY_OP_SD#	x	
OP_SD#_IO	3.4v	
AZ_RST#_AUD_IO	x	
DLY_OP_SD#	x	
DLY_OP_SD#_R	x	

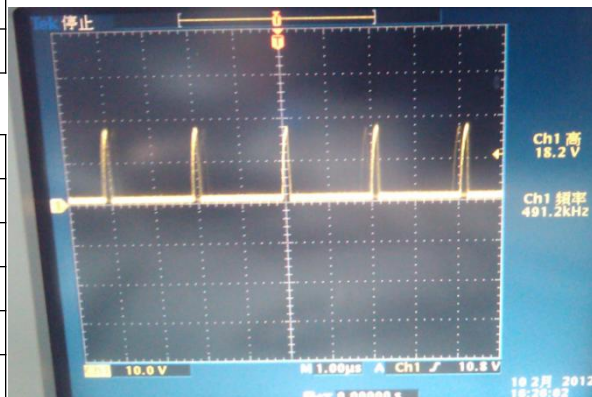
P1



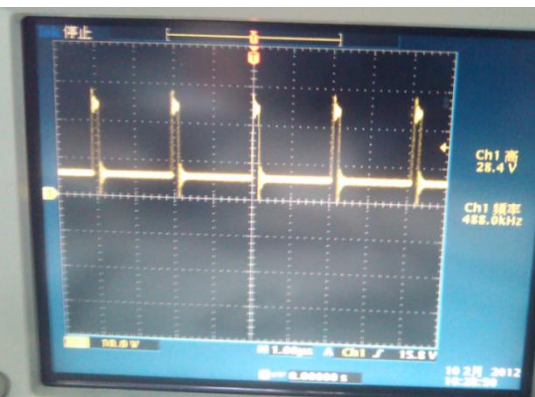
P3



P2



P4



Charger and other Pin Voltage

MB39A132

MB39A132		
P_AC_APR_UC_10	9.4V	
P_CHG_ADIN_S	18.7V	
P_CHG_ACOK#_10		0 Adaptor Mode
P_CHG_ACOK#_10	3.4V	Battery Mode
P_CHG_VIN_S	18.7V	
P_CHG_UGR_20	X	
P_CHG_UG_20	X	
P_CHG_PHASE_S	X	
P_CHG_LG_20	X	
CHG_VCC	19V	
P_CHG_AIRS-_5	19V	
P_CHG_AIRS+_5	19V	
P_CHG_ACIN_10	1.8V	
P_CHG_ACOK#_10	720mv	
P_CHG_INE3-_10	X	
P_CHG_ADJAI_10	X	

LED/PWR SWICH

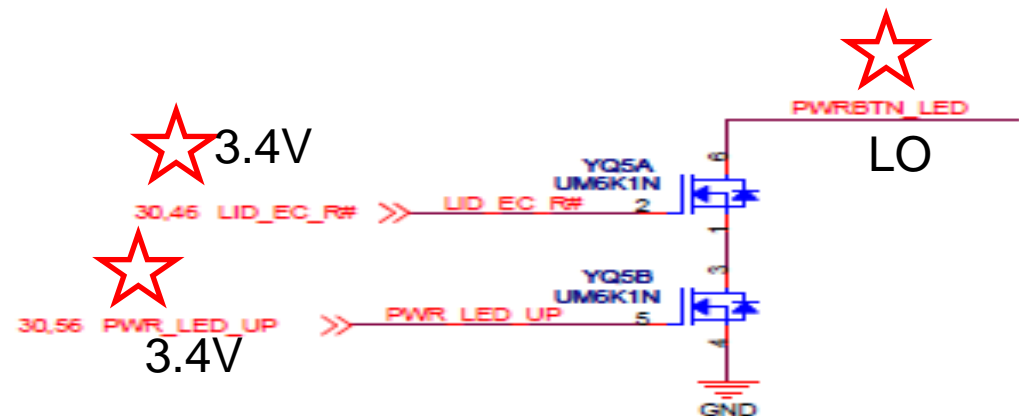
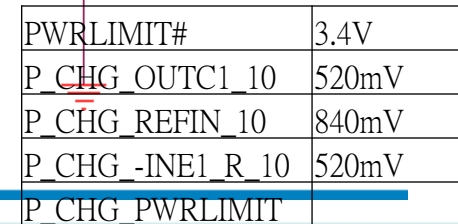
PWR_LED_UP		3.4V
SATA_LED#		1.3V
WLAN_LED		3.4V
Caps_LED#		3.4V
CHG_LED_GREEN#		3.4V
CHG_LED_ORANGE#		3.4V
BAT_IN#		3.4V

No PUT IN BATTERY

Bat COMM1		
pin1		x
pin2		x
pin3		3.3V
pin4		x
pin5		x
pin6		x
pin7		x
pin8		X
pin9		X

PUT IN BATTERY

Bat COMM1		
pin1		x
pin2		x
pin3		x
pin4		3.3V
pin5		3.3V
pin6		X
pin7		X
pin8		9.7V
pin9		9.7V



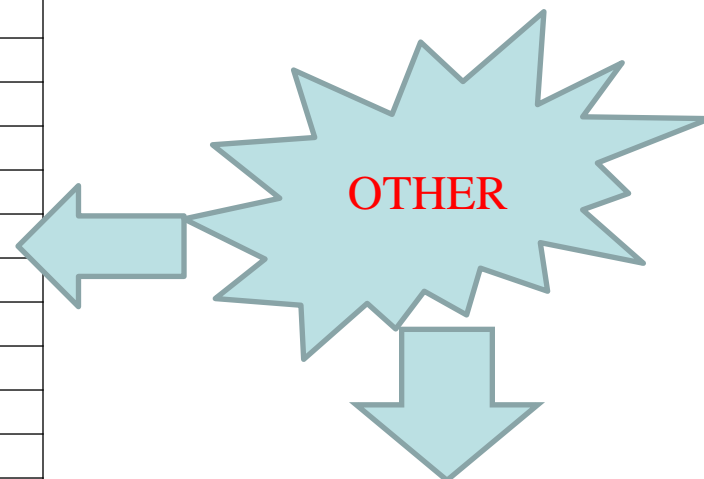
U4008-ASM1042

USB3.0 SPI ROM

USB3.0

INTROMEN	3.3V
U3_SMI#	3.3V
CSEL	3.3V
PESEL	3.3V
PEPWRDET	3.3V
PECLKREQ#	X
SPI_CLK_IO	X
SPI_DO_IO	X
SPI_CS_B	3.3V
SPI_DI_IO	3V
B_UDN_AS	X
PCIE_WAKE#_IO_AS	3.3V
U3_PPON1	3.3V
U3_PPON2	3.3V
U3_OC1	X
U3_OC2	3.3V
IO_BUF_PLT_RST#	3.3V
TEST_EN	X
B_URXP_AS	1.3V
B_URXN_AS	1.3V
B_UTXP_AS	800mV
B_UTXN_AS	800mV
UREXT	1.2V
CLK_PCIE_USB#_PCH_IO_AS	100MHZ
CLK_PCIE_USB_PCH_IO_AS	100MHZ
USB_48M_IO	x
+5V_USB1	5V
PORST#	3.28V
U4007 USB BIOS	
VDD12U	1.2V
XI_AS	20MHZ
XO_AS	20MHZ
+3V_U3	3.3V

SPI_CS_B_IO	3.3V
SPI_DI_IO	3V
WP#_48	3.3V
+3V_U3	3.3V
D3823#2	19.3V
PQ1#1	19.3V
PQ1#2	9.5V
PQ1#3	19.3V
PQ1#4	9.5V
PQ1#5	19.3V
PQ1#6	19.3V
PQ1#7	19.3V
PQ1#8	19.3V
Q5721#3	3.3V
PCE2#1	5V
Q0504#3	1.5V
Q0505#1	1.5V
Q0505#2	1.5V
Q0505#3	2.2V
Q0506#1	1.5V
Q0506#2	1.5V
Q0506#3	3.2V
Q0507#1	3.3V
Q0507#2	2.2V
Q0507#3	3.3V
BUF_PLT_RST#_IO	3V
U3_SMI#	3.4V
SMI_B_IO	3.4V

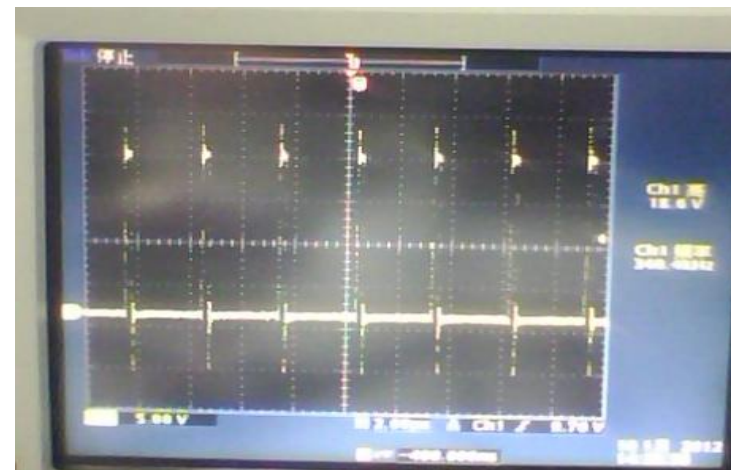


PM_LEVELDOWN#	X	
PWR_SW#_IO	3V	
PWRBTN_LED_IO	X	
PWRON_LED+	2.9V	
MIC1_JD	2.4V	mic in will pull low
DLY_OP_SD#	x	
OP_SD#_IO	3.4v	
AZ_RST#_AUD_IO	x	
DLY_OP_SD#	x	
DLY_OP_SD#_R	x	

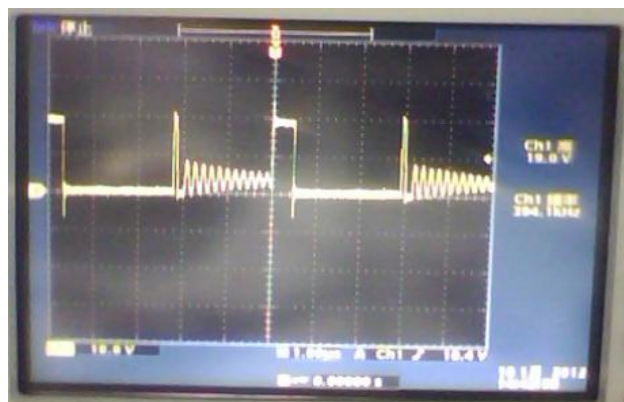
PL Pin Voltage & waveform

P_+5VSUS_PHASE_S	PL403#2	18.6V-24V-340Khz	P4
+5VSYS	PL403#1	5V	
P_+3VSUS_PHASE_S	PL404#1	18.6V-24V-340Khz	P2
3VSYS	PL404#2	3V	
VDDCR_CPU	PL306#2	1.24V	
P_CPU_PHASE_S	PL306#1		P3
P_NB_PHASE_S	PL305#2		P3
VDDCR_NB	PL305#1	960mv-1.1V	
CHG_PHASE_S	PL103#1	400mv	
CHG_BAT_S	PL103#2	400mv	
P_1.1VSUS_PHASE_S	PL602#1		P1
+1.1VSUS	PL602#2	1.1V	

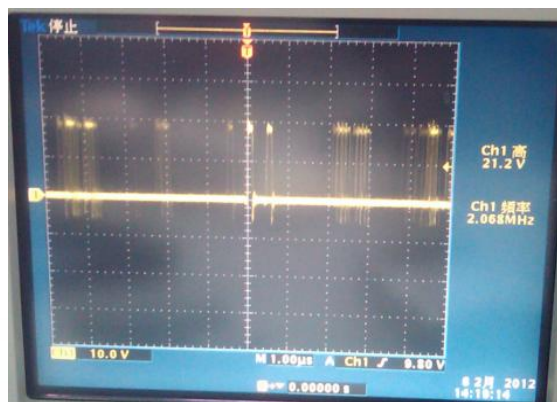
P1



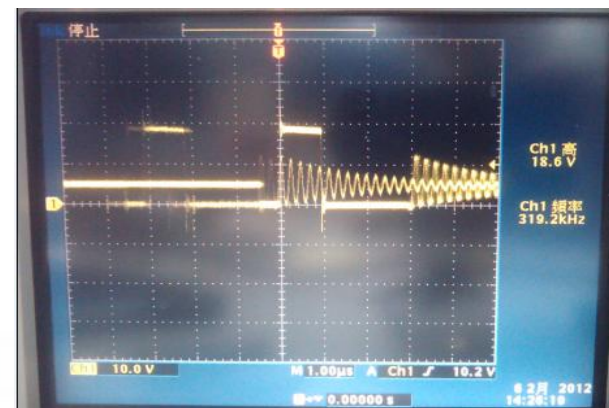
P2



P3



P4



Issue Analyze

- Can't power on, power LED not shine
 - Clear CMOS, re-flash BIOS
 - No VSUS power, check VSUS_ON, +3VA, EC_RST#, ECCLK...
- Can't power on, and the adaptor LED indication flicker
 - Somewhere short, touch voltage controller chips to find which is too hot.
 - Check all power rails
- Can power on, but can't boot to DOS/OS
 - Connect LPC debug card to view the 80 POST code
 - 00h, 19h, 34等乱当, check RTC battery is plugged or voltage is abnormal
 - 00h, debug card LED no blink → CPU not work, check power sequence, some important signal: LPC_FRAME#, APU_LDT_RST#, A_RST#, PM_PWROK, System CLK ...
 - 15-19h, maybe Memory, check Memory related
 - D0h, CPU Error

Note: Because at now is use EFI BIOS, language is C, different from legacy BIOS, post code不固定.

Issue Analyze

- Can boot to DOS/OS, but then auto shutdown
 - Check FAN status/thermal module – > over temperature?
 - Adapter power LED blink?
 - Check which power (first voltage ,then current) abnormal when shutdown, you should better use oscilloscope
- Device don' t work
 - Check device present or not?
 - Yes, Is the driver right?
 - No, check its Power, Reset, Control signal
- Blue Screen or other crash under OS
 - When happen? S3/S4/Reboot/running in OS, or After install some software?
 - Check BSOD code (Analyze with Windbg.exe) or Windows event log
 - Disable each device or remove device to find which device cause it, then re-install its driver
 - check FAN status/thermal module – > over temperature?
 - Change DIMM, HDD, disable PowerNOW!...

Q&A